CLAIMS:

1. A black low thermal expansion high specific rigidity ceramic sintered body, characterized by having a thermal expansion coefficient of not more than 0.6×10^{-6}/°C in absolute value at room temperature, a modulus of elasticity (Young's modulus) of not less than 100 GPa, and specific rigidity (Young's modulus/specific gravity) of not less than 40 GPa·cm^3/g and assuming a black tone.

2. A black low thermal expansion high specific rigidity ceramic sintered body, characterized by having a chemical composition comprising 8.0 - 17.2 mass % of MgO, 22.0 - 38.0 mass % of Al_2O_3, 49.5 - 65.0 mass % of SiO_2, a total of 0.1 - 2 mass % of one or more transition elements as reduced to oxides, and 0 - 2.5 mass % of Li_2O, and having the mass ratios satisfy the relationships of $(SiO_2 - 8 \times Li_2O)/MgO \geqq 3.0$ and $(SiO_2 - 8 \times Li_2O)/Al_2O_3 \geqq 1.2$.

3. A black low thermal expansion high specific rigidity ceramic sintered body according to claim 2, wherein the thermal expansion coefficient is not more than 0.6×10^{-6}/°C in absolute value at room temperature, the modulus of elasticity is not less than 100 GPa, and the specific rigidity is not less than 40 GPa·cm^3/g and the tone of the sintered body is black.

4. A black low thermal expansion high specific rigidity ceramic sintered body according to any one of claims 1 through 3, wherein the total reflectivity of the sintered body is not more than 17% at a wavelength of light in the range of 200 - 950 nm.

5. A black low thermal expansion high specific rigidity ceramic sintered body according to any one of claims 1 through 4, wherein the apparent porosity of the sintered body is not more than 2%.

6. A black low thermal expansion high specific rigidity ceramic sintered body according to any one of claims 1 through 5, wherein not less than 80 vol. % of the crystal phase of the sintered body is a crystal phase of cordierite.

7. A black low thermal expansion high specific rigidity ceramic sintered body according to any one of claims 1, 3, 4, 5, and 6, wherein the thermal expansion coefficient is not more than $0.3 \times 10^{-6}/°C$ in absolute value at room temperature.

8. A black low thermal expansion high specific rigidity ceramic sintered body according to any one of claims 1, 3, 4, 5, 6, and 7, wherein the modulus of elasticity is not less than 120 GPa and the specific rigidity is not less than 50 $GPa \cdot cm^3/g$.

9. A black low thermal expansion high specific rigidity ceramic sintered body according to any one of claims 2 through 8, wherein the chemical composition has such mass ratios as satisfy the relationships of $(SiO_2 - 8 \times Li_2O)/MgO \geqq 3.65$ and $(SiO_2 - 8 \times Li_2O)/Al_2O_3 \geqq 1.3$.

10. A method for the production of a black low thermal expansion high specific rigidity ceramic sintered body, characterized by forming the sintered body in an atmosphere of a non-oxidizing gas at a temperature in the range of 1200 - 1500°C.

11. A method for the production of a black low thermal expansion high specific rigidity ceramic sintered body set forth in any one of claims 1 through 9, wherein the sintered body is formed in an atmosphere of a non-oxidizing gas at a temperature in the range of 1200 - 1500°C.

12. A method for the production of a black low thermal expansion high specific rigidity ceramic sintered body according to claim 10 or 11, wherein the non-oxidizing gas

is one or more members selected among argon, helium, nitrogen and hydrogen.

13. A method for the production of a black low thermal expansion high-specific rigidity ceramic sintered body according to any one of claims 10 through 12, wherein the raw material powder is one or more members selected from the group consisting of cordierite powder, talc, magnesia spinel, magnesia, magnesium hydroxide, magnesium carbonate, Li_2O-Al_2O_3-SiO_2 type powders (petalite, spodumene, and eucriptite), lithium hydroxide, lithium carbonate, alumina powder, silica powder, kaolin powder, and mullite powder.

14. A method for the production of a black low thermal expansion high specific rigidity ceramic sintered body according to claim 13, wherein not less than 70 mass % of the MgO component as the MgO-source raw material is supplied by one or more members selected from the group consisting of electro-molten cordierite powder, synthetic cordierite powder, and talc powder.

15. A method for the production of a black low thermal expansion high specific rigidity ceramic sintered body according to any one of claims 10 through 14, wherein the sintering method is a hot press method, an HIP method, a gas pressure sintering method, or a normal pressure sintering method.

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